UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,182	09/28/2000	Antoine Drouot	PHF 99.584	9178

24737 7590 06/01/2005		EXAMINER
PHILIPS INTELLECTUAL PROPERTY & STANDARDS		MACKOWEY, ANTHONY M
P.O. BOX 3001	ART UNIT	PAPER NUMBER
BRIARCLIFF MANOR, NY 10510	2623	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _16 December 2004_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-9_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-9_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

The amendment filed December 16, 2004 has been entered and made of record.

Applicant's arguments, see page 4, lines 5-7, filed December 16, 2004 with respect to the objection of claim 9, have been fully considered and are persuasive. The objection of claim 9 has been withdrawn.

Applicant's arguments, see page 4, line 8 thru page 5, line 7, filed December 16, 2004 with respect to claims 1-3 and 8 rejected under U.S.C. 102(b) as be anticipated by Jayant et al., have been fully considered but they are not persuasive.

Applicant indicates the Jayant spatial filter inputs, from a temporal filter 110, a set of frames 103 and outputs a set of reconstructed frames 104 (page 4, lines 10-11). Applicant argues that Jayant fails to disclose or suggest that the pixel to be filtered is in the same picture as the set of moving, non-smooth, non-edge pixels (page 4, lines 12-13). The Examiner disagrees. Jayant teaches a video sequence comprises a series of images. Each image in the series of images comprises a plurality of picture elements (e.g., pixels) conveniently referred to as a frame (col. 1, lines 13-15). Further Jayant recites "It should now be apparent that for <u>pixels represented in each given partially</u> <u>reconstructed frame</u> in the set of partially reconstructed frames 103, the spatial post-filter 112 does not adjust the pixel if it is a non-edge, non-smooth, non-moving pixel." From these teachings it is clear spatial filtering is performed frame by frame, the pixels would therefore be in the same image (picture).

In response to the applicant's arguments that Jayant fails to disclose or suggest

that moving, non-smooth, non-edge pixels are in immediate adjacency of the pixel to be

filtered (page 4, lines 13-16), the Examiner refers to Fig. 6, which shows moving, non-

smooth, non-edge pixels are filtered using a median filter 152. Jayant teaches the

median filter has a 3x3 window size (col. 9, lines 18-19). For explaining the well-known

functionality of a median filter, Examiner refers to Chapter 16, page 365 of the book

Digital Image Processing: Principles and Applications by Gregory Baxes. Baxes teaches

a median filter selects the fifth-ranked pixel value as an output to an inputted group

(3x3) of pixels (page 365, lines 2-5). Jayant clearly indicates the pixel to be filtered in

each window is the center pixel (col. 8, lines 57-59; Equation 12; Figure 2). All

surrounding pixels in the 3x3 window are immediately adjacent to the center pixel.

Therefore, in Jayant it is inherent that the moving, non-smooth, non-edge pixels are in

immediate adjacency of the pixel to be filtered.

In response to the applicant's arguments that Jayant fails to disclose or suggest

that any smooth pixel to be filtered within a picture by a median filter is inputted into that

filter, at least since that pixel to be filtered is filtered by a double median filter (page 4,

lines 17-19), it is noted that the rejected claims do not recite such a limitation.

For all reasons presented above and those presented in the previous Office

Action (page 3 thru page 4, line 2), Claims 1-3 and 8 stand rejected under 35 U.S.C.

102(b) as being anticipated by Jayant et al.

Applicant's arguments, see page 5, line 8 thru page 6, line 13, filed December

16, 2004, with respect to Claims 1-4, 8 and 9 rejected under U.S.C. 35 103(a) as

unpatentable over U.S. Patent No. 6,229,578 to Acharya et al. have been fully

considered and are persuasive. The rejection of claims 1-4, 8 and 9 has been

withdrawn.

Applicant's arguments on page 6, lines 14-18, filed December 16, 2004 with

respect to the rejection of claims 5-7 under 35 U.S.C. 103(a) as unpatentable over

Jayant in view of U.S. Patent 5,852,475 to Gupta et al. have been fully considered but

they are not persuasive. Applicant argues Gupta cannot make up for the shortcomings

of Jayant, however the examiner has shown Jayant meets all the limitations recited in

claim 1, thus there are no shortcomings and the proposed combination as presented in

the previous Office Action (page 6, line 14 thru page 8, line 5) would render obvious the

present invention as recited in claims 5-7.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by

Jayant et al. (USPN 5,473,384, previously cited, hereafter Jayant).

Regarding claims 1 and 8, Jayant discloses method of processing data which

represent a sequence of pictures, previously encoded and decoded and a filtering

device carrying out the method, comprising the steps of: examining pixels within a

picture of said sequence to detect (classify) edge pixels and non-edge pixels (column 6, line 63-column 7, line 20); choosing pixels from among the detected non-edge pixels a pixel to be filtered (Figure 6, numeral 146 and 150; column 8, line 45-54); replacing the chosen pixel (center of 3x3 filter window) with a pixel value that is selected from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency (3x3 filter window inherently includes 8 pixels immediately adjacent the center pixel) with said chosen pixel (Figure 2; column 8, line 54-column 9, line 2, line 18-21).

Regarding claim 2, Jayant discloses that the selected pixel is the median pixel of a set having an odd number of members from among said detected non-edge pixels (3x3 filter window contains 9 members), at least one of said odd number of members being said chosen (center) pixel, said odd number of members comprising said at least one pixel in immediate vertical, horizontal, or diagonal adjacency (Figure 2; column 8, line 54-column 9, line 2, line 18-21).

Regarding claim 3, Jayant discloses that the method is applied to the luminance (intensity) component of the pixels of said picture (column 6, line 31-39).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jayant as applied to claim 1 above.

Regarding claim 4, Jayant discloses the use of gradients and thresholds (column 8, line 10-33) but does not explicitly disclose that a pixel is detected as an edge pixel if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold. The examiner takes Official Notice that edge detection using gradient thresholds is well known in the art of image processing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect a pixel as an edge pixel if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold in order to quickly and accurately determine which pixels are located at edges, and which pixels are not located at edges.

Regarding claim 9, Jayant does not disclose a computer-readable storage medium comprising a software module for storing a set of instructions executable under the control of a computer or a processor. The examiner takes Official Notice that it is well known in the art to adapt a processing method to be stored on a computer-readable storage medium as instructions executable by a computer or a processor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adapt the method of claim 1 to be stored as executable instructions on a computer-readable storage medium in order to allow a computer or processor to execute the method steps.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Jayant as applied to claim 4 above, and further in view of Gupta et al. (USPN

5,852,475, previously cited), hereafter Gupta.

Regarding claims 5 and 6, Jayant does not disclose that a pixel is detected as an

edge pixel if the horizontal (or vertical) component of a gradient of said pixel is greater

than the vertical (or horizontal) component of said gradient and if the modulus of said

gradient is greater than both the modulus of the gradient of the adjacent pixel on the left

(or lower pixel) and the modulus of the gradient of the adjacent pixel on the right (or

upper pixel). Gupta discloses a transform artifact reduction process wherein a plurality

of different Sobel-based operators are used to determine edge directions within a three-

by-three windows surrounding a pixel of interest (column 16, line 19-53). Gupta further

discloses combining the plurality of spatial gradients to obtain the center pixel gradient

by weighting different pixels within the window (column 16, line 54-column 17, line 42).

Gupta does not explicitly state that the modulus of said gradient is compared with the

modulus of the gradient of the adjacent pixels, but it is inherent that if a pixel is detected

as an edge that the pixels on either side of that edge will have a gradient magnitude

less than that of the pixel lying on the edge. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to detect horizontal and

vertical edges as taught by Gupta in order to generate a pixel texture estimator for each

of the possible edges in a three-by-three window using weighting based on Sobel

operators which has been widely tested and reported as providing good performance

(column 17, line 9-24).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jayant as

applied to claim 1 above, and further in view of Gupta et al. (USPN 5,852,475,

previously cited, hereafter Gupta).

Regarding claim 7, Jayant does not disclose that a pixel is filtered if the number

of edge pixels in a defined neighborhood of the pixel lies within a defined range. Gupta

discloses a transform artifact reduction process including a continuous non-edge check

901 which determines whether enough non-edge pixels are present in the three-by-

three window (which inherently includes a certain number of edge pixels within a

defined range) including the current pixel to perform further directional-filtering without

filtering an edge pixel (column 21, line 23-28). It would have been obvious to one of

ordinary skill in the art at the time the invention was made to filter a pixel if the number

of edge (and non-edge) pixels in a defined neighborhood of the pixel lies within a

defined range as taught by Gupta in order to ensure that at least a certain number

(three) of pixels in the current window are edge (or non-edge) pixels so that a

continuous line of non-edge pixels may exist through the window, and to prevent a

situation where any one-dimensional filter along any possible axis through the current

window from including an edge pixel (column 21, line 29-37).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Mackowey whose telephone number is (571) 272-7425. The examiner can normally be reached on M-F 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (571) 272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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5/24/2005

Jon Chang
Primary Examiner